School of Computer Science and Engineering Presentation

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A Data-Driven Approach to Image Splicing Localization

Abstract: With the advent of Web 2.0 and ubiquitous adoption of low-cost and high-resolution digital cameras, users upload and share images on a daily basis. This trend of public image distribution and access to user-friendly editing software, such as Photoshop, has made image forgery a serious issue. Splicing is one of the most common types of image forgery. It manipulates images by copying a region from one image (i.e., the donor image) and pasting it onto another image (i.e., the host image). Forgers often use splicing to give a false impression that there is an additional object present in the image, or to remove an object from the image.

Many of the current splicing detection algorithms only deduce whether a given image has been spliced and do not attempt to localize the spliced area. Relatively few algorithms attempt to tackle the splicing localization problem, which refers to the problem of determining which pixels in an image have been manipulated as a result of a splicing operation.

In this talk, I will present two different splicing localization techniques that we have developed, and which achieve state-of-the-art results on several datasets. The first is the Multi-task Fully Convolutional Network (MFCN), which is a deep-learning-based approach. The second approach is significantly more efficient than the MFCN and is based on cPCA++, which is a new data visualization and clustering technique that we have developed.